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GROUPS OF PLANTS VALUABLE FOR WILDLIFE UTILIZATION AND EROSION CONTROL

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INTRODUCTION

The American public now realizes the evils of soil erosion and is inclined to do everything possible to remedy them. Among methods of controlling erosion, the establishment and maintenance of vegetative cover on the soil is favored as being simple and effective, economical and lasting. Although plants vary in efficiency as soil binders, almost any of them is of some use. Where vegetative cover is to be restored by planting, choice will be limited in most cases by the character of the existing ground surface. If this is badly eroded, relatively few plants are adapted to growth there. Fortunately, among the pioneering types are some that are of value to wildlife.

For example, on Cecil clay loam, a soil of the piedmont section of North Carolina that is often seriously eroded, Lee,¹ a soil surveyor of the Bureau of Chemistry and Soils, reports that—

Abandoned fields first grow up in broom-sedge and brambles, followed the second year by sassafras and sumac bushes, and yellow pine, and in a few years, except on badly eroded areas, there is a good stand of pine. Forested areas support a fair or good growth of white, red, black, post, scarlet, and chestnut oaks, shortleaf or yellow pine, spruce, pitch, and white pines, hickory, black gum, yellow poplar, dogwood, and a few persimmon, locust, sourwood, black walnut, white elm, sweet gum, red cedar, and hemlock trees.

Commenting on these plants, in the order named, it may be said that broomsedge affords good cover, and brambles (that is dewberries, blackberries, and the like) provide both cover and food for small forms of wildlife, including cottontail rabbits, quail, and other game species. Sassafras and sumac fruits are eaten by many birds

¹ LEE, W. D., and BACON, S. R. SOIL SURVEY OF BURKE COUNTY, NORTH CAROLINA. U. S. Dept. Agr., Bur. Chem. and Soils, Ser. 1926, no. 22, p. 16. 1930.

and mammals. Yellow pine according to its height furnishes cover for both ground and above-ground fauna and when mature produces in seed years a food supply that is appreciated by many species. In the forests the various oaks, through their acorn crops, contribute heavily to the upkeep of wildlife; all the pines function in the same way as previously noted for the yellow pine; the hickory and walnut are valuable to squirrels and a few other species; the black gum, dogwood, persimmon, and red cedar yield fruits that are sought by a variety of forms of wildlife; the yellow poplar, locust, white elm, and hemlock bear seeds that are eaten in small quantity, and the red cedar in addition to its fruit-bearing rôle affords first-class cover. Thus practically every plant that the soil surveyor thought deserving of mention as a pioneer on eroded Cecil clay loam is of some value to wildlife.

PLANTS UTILIZED BY WILDLIFE

The story would be the same for other soils and regions, even with their different types of vegetation, for the reason that a very large number of plants are in some degree utilized by wildlife. Considering land plants alone, the parts most eaten are the leaves (often with parts of the branches and stems in woody species, collectively known as browse), the buds, and the fruits or seeds. Fruits of the particular type known as nuts are referred to in the aggregate as mast and are an important food supply for certain domestic as well as for various wild animals.

In addition to browsing, there may be mentioned grazing (that is, feeding on grass and other herbage). This seems to have been the principal mode of feeding of the bison, or buffalo, and is important also to elk, especially in summer. It figures less than is popularly supposed, however, in the feeding habits of deer, antelope, rabbits, and hares, which depend more upon woody plants, or true browse. All these creatures take some grass and herbs, it is true, and the leaves of grass and of many other plants are freely eaten by quail and grouse and nipped by numerous smaller vegetarian birds.

Buds, while taken by the browsers along with leaves and twigs, are sought alone as a substantial part of the diet by grouse and some smaller birds, especially in winter. Fleshy fruits are eaten by mammals in general (except the most pronounced carnivores), by practically all land game birds, and by a great many smaller birds, especially by such groups as the mockingbird, catbird, and thrashers; robins, thrushes, and bluebirds; waxwings; starling; orioles; and tanagers. Mast is the great dependence of squirrels but is taken by many other mammals ranging in size from deer to mice, by wild turkeys, grouse, and quail, and among other birds by woodpeckers, jays, crows, titmice, and nuthatches. Tree seeds are sought while on the trees by squirrels, woodpeckers, jays, pine and evening grosbeaks, redpolls, siskins, goldfinches, and crossbills. When they fall, especially in the case of common pines, black locust, and sweetgum, the seeds may be of great importance for the time being to doves, quail, and various other ground-feeding birds and mammals. Seeds of grasses, sedges, and other herbs contribute substantially to the diet of doves, meadowlarks, blackbirds, cowbirds, redpolls, buntings, finches, sparrows, juncos, and longspurs.



B35728; B3112M

A, Manzanita (*Arctostaphylos*): Evergreen cover, good browse, and persistent fruit. B, Mountain juniper (*Juniperus communis montana*): Excellent evergreen cover, good browse, and persistent fruit.



B3235

Aspen (*Populus tremuloides*): One of the best browse and budding plants.

The production of food, indispensable though it may be, cannot be ranked unconditionally as first among the uses of plants to wildlife. Food there must be, but the ways of wildlife are such that food can scarcely be utilized unless situated in or near suitable cover. Defining suitable cover may be difficult. One thinks first of its concealing capacity, but there is to be considered also its actual mechanical efficiency in excluding predators or at least in impeding their progress. In summer the provision of shade may be an important attribute of cover, and at all times the convenient location of cover in relation to food supplies is a prime consideration. Man may appraise cover requirements to the best of his ability and plan and modify cover according to this appraisal, but the final test of value is the degree of use, and sometimes this appears to depend upon something that the particular form of wildlife concerned recognizes but man does not. Man does the best he can by providing cover good for quick refuge, temporary concealment, and more or less permanent lodging, using a variety of plants to form it, distributing rather than concentrating it, and making it of food-bearing species or placing it so as to be readily accessible to food supplies.

The genera of plants known to be of most value in providing cover, browse, herbage, mast, fruit, and seeds for wildlife are herewith listed in systematic order.² It is realized that in a single genus the species may differ greatly in value to wildlife, but details for all genera are not well enough known to justify tabulation by species. Any available native species of the genera listed may be transplanted, or representatives (native or exotic) may be obtained from nurseries. No barberries, currants, or buckthorns are included, because they harbor destructive rusts. Omitted also are plants poisonous to man on contact, as poison-ivy and poison sumac, as well as various kinds dangerously poisonous either to wild or to domestic animals, when eaten, as yew, wild cherry, lupine, laurel, rhododendron, and groundsel (*Senecio*).

COVER PLANTS

Cover for ground dwellers consists of plants of sufficient height to conceal the forms of wildlife concerned. It seems most effectual if dense, stiff, thorny, or evergreen (pl. 1). Plants that form thickets even so extensive as to dominate the landscape are good cover species. Cover for the above-ground fauna is most satisfactorily provided by dense evergreen trees. Deciduous plants, on the other hand, unless of very dense growth, are not of much value for cover except in summer.

Pine (*Pinus*).
Spruce (*Picea*).
Hemlock (*Tsuga*).
Douglas fir (*Pseudotsuga*).
Fir, balsam (*Abies*).
Arboreal (*Thuja*).
White cedar (*Chamaecyparis*).

Juniper, red cedar (*Juniperus*)³
(pl. 1, B).
Scrub palmetto (*Serenoa*).
Greenbrier (*Smilax*).
Waxmyrtle (*Myrica*).
Sweetfern (*Comptonia*).
Willow (*Salix*).

² HELLER, A. A. CATALOGUE OF NORTH AMERICAN PLANTS NORTH OF MEXICO, EXCLUSIVE OF THE LOWER CRYPTOGAMS. Ed. 2, 252 pp. 1900.

³ Such low junipers as *Juniperus communis*, *J. prostrata*, and *J. sabina* are excellent cover: red cedar (*J. virginiana*), an alternate host of apple rust, should not be planted near apple orchards.

Hazel (*Corylus*).
 Birch (*Betula*).
 Alder (*Alnus*).
 Oak (*Quercus*).⁴
 Osage-orange (*Toxylon*).
 Hop (*Humulus*).
 Saltbush (*Atriplex*).
 Winterfat (*Eurotia*).
 Clematis (*Clematis*).
 Cotoneaster (*Cotoneaster*).
 Hawthorn (*Crataegus*).
 Apple (*Malus*).⁵
 Squaw-apple (*Peraphyllum*).
 Blackberry, raspberry (*Rubus*).
 Bush cinquefoil (*Dasiphora*).
 Mountain-mahogany (*Cercocarpus*).
 Chamise (*Adenostoma*).
 Antelope-brush (*Purshia*).
 Blackbrush (*Coleogyne*).
 Bearmat (*Chamaebatia*).
 Rose (*Rosa*).
 Plum (*Prunus*).
 Catclaw (*Acacia*).
 Mimosa (*Mimosa*).
 Mesquite (*Prosopis*).
 Screwbean (*Strombocarpa*).
 Partridge-pea (*Chamaecrista*).
 Paloverde (*Cercidium*).
 Siberian pea-tree (*Caragana*).
 Locust (*Robinia*) (pl. 7, B).
 Prickly-ash (*Zanthoxylum*).
 Jojoba (*Simmondsia*).
 Sumac (*Rhus*).
 Holly (*Ilex*).

Wintercreeper (*Euonymus*, vine species).
 Bittersweet (*Celastrus*).
 Jujube (*Zizyphus*).
 Deer brush, Jersey-tea (*Ceanothus*).
 Grape (*Vitis*).
 Virginia creeper (*Parthenocissus*).
 Salteedar (*Tamarix*).
 Pricklypear, tuna, cholla (*Opuntia*).
 Buffaloberry (*Lepargyrea*).
 Elaeagnus (*Elaeagnus*).
 Dogwood (*Cornus*) (pl. 4, A).
 Salal (*Gaultheria*).
 Manzanita (*Arctostaphylos*) (pl. 1, A).
 Huckleberry (*Gaylussacia*).
 Blueberry (*Vaccinium*) (pl. 4, B).
 Lantana (*Lantana*).
 Sage (*Salvia*).
 Matrimony-vine (*Lycium*).
 Desertwillow (*Chilopsis*).
 Trumpetreeper (*Tecoma*).
 Snowberry, coralberry (*Symphoricarpos*).
 Honeysuckle (*Lonicera*).
 Mock-cucumber (*Micrampelis*).
 Climbing boneset (*Mikania*).
 Rabbitbrush (*Chrysothamnus*).
 Seepwillow (*Baccharis*).
 Arrowweed (*Pluchea sericea*).
 Burrobrush (*Hymenoclea*).
 Bur-sage (*Franseria*).
 Brittlebush (*Encelia*).
 Tarbush (*Flourensia*).
 Poreleaf (*Porophyllum*).
 Sagebrush (*Artemisia*).

BROWSE PLANTS

So far as known, the buds of relatively few plants are especially sought by wildlife. The favorite budding trees are *Populus* (pl. 2) and *Betula* with others of their respective families coming next in rank. The catkins of these and other amentaceous plants are eaten. Browse is interpreted to cover bark, buds, and whole pods, particularly pods that are eaten in their entirety, as of mesquite and honeylocust, and whole heads of fruits, as the "bobs" of sumac. Entries in this list preceded by an asterisk (*) are made on the basis of the preferences of range stock, so may not prove well founded for wildlife.

Pine (*Pinus*).
 Tamarack (*Larix*).
 Spruce (*Picea*).
 Hemlock (*Tsuga*).
 Douglas fir (*Pseudotsuga*).
 Fir, balsam (*Abies*).
 Arborvitae (*Thuja*).
 White cedar (*Chamaecyparis*).
 Juniper, red cedar (*Juniperus*) (pl. 1, B).
 Jointfir (*Ephedra*).
 Greenbrier (*Smilax*).

Hickory (*Hicoria*).
 Sweetfern (*Comptonia*).
 Cottonwood, aspen (*Populus*) (pl. 2).
 Willow (*Salix*).
 Blue beech (*Carpinus*).
 Hophornbeam (*Ostrya*).
 Hazel (*Corylus*).
 Birch (*Betula*).
 Alder (*Alnus*).
 Beech (*Fagus*).
 Chestnut (*Castanea*).
 Oak (*Quercus*).

⁴ Scrub oaks and those of any height with persistent or evergreen leaves are the best.

⁵ Crabs and wild seedlings of the cultivated apple.



B2902M

Serviceberry or shadbush (*Amelanchier*): Browse and early season fruit.



B2914M; B3085M

A. Flowering dogwood (*Cornus florida*): Of some value as cover and browse and excellent for persistent fruit. B. A blueberry (*Vaccinium vitis-idaea*): Fair cover, good browse, and excellent summer fruit.

Elm (*Ulmus*).
 Hackberry (*Celtis*).
 Mistletoe (*Razoumofskyia*).
 Buckwheatbrush (*Eriogonum microthecum*, *E. wrightii*).
 Saltbush (*Atriplex*).
 *Hop-sage (*Grayia*).
 Winterfat (*Eurotia*).
 Greasewood (*Sarcobatus*).
 Sassafras (*Sassafras*).
 Witch-hazel (*Hamamelis*).
 Sycamore (*Platanus*).
 Hawthorn (*Crataegus*).
 Apple (*Malus*)⁵.
 Mountain-ash (*Sorbus*).
 Chokeberry (*Aronia*).
 Serviceberry (*Amelanchier*) (pl. 3).
 Squaw-apple (*Peraphyllum*).
 Blackberry, raspberry (*Rubus*).
 Bush cinquefoil (*Dasiphora*).
 *Apache-plume (*Fallugia*).
 Cliffrose (*Cowania*).
 Mountain-mahogany (*Cercocarpus*).
 Antelope-brush (*Purshia*).
 Rose (*Rosa*).
 *False-mesquite (*Calliandra*).
 Catclaw (*Acacia*).
 *Mimosa (*Mimosa*).
 Mesquite (*Prosopis*).
 *Screwbean (*Strombocarpa*).
 Redbud (*Cercis*).
 *Ratany (*Franeria*).
 Honeylocust (*Gleditsia*).

*Jerusalem-thorn (*Parkinsonia*).
 Paloverde (*Cercidium*).
 Pea chaparral (*Pickeringia*).
 *Kidneywood (*Eysenhardtia*).
 Locust (*Robinia neomexicana*).
 Tesota (*Olneya*).
 Jojoba (*Simmondsia*).
 Sumac (*Rhus*).
 Maple (*Acer*).
 Deer brush, Jersey-tea (*Ceanothus*).
 Grape (*Vitis*).
 Basswood (*Tilia*).
 Flannelbush (*Fremontia*).
 *Pricklypear, tuna, cholla (*Opuntia*).
 Buffaloberry (*Lepargyrea*).
 Aralia (*Aralia*).
 Dogwood (*Cornus*) (pl. 4, A).
 Trailing arbutus (*Epigaea*).
 Wintergreen (*Gaultheria*).
 Manzanita (*Arctostaphylos*) (pl. 1, A).
 Huckleberry (*Gaylussacia*).
 Blueberry (*Vaccinium*) (pl. 4, B).
 Ash (*Fraxinus*).
 Matrimony-vine (*Lycium*).
 Elderberry (*Sambucus*) (pl. 5, A).
 Blackhaw, cranberrybush (*Viburnum*).
 Snowberry, coralberry (*Symphoricarpos*).
 Honeysuckle (*Lonicera*).
 Rabbitbrush (*Chrysothamnus*).
 Burrobrush (*Hymenoclea*).
 *Bur-sage (*Franeria*).
 Sagebrush (*Artemisia*).

HERBAGE

Woodfern (*Dryopteris*).
 Bracken (*Pteridium*).
 Galleta (*Hilaria*).
 Cupgrass (*Eriochloa*).
 Switchgrass (*Panicum*).
 Three-awn (*Aristida*).
 Needlegrass (*Stipa*).
 Timothy (*Phleum*).
 Dropseed (*Sporobolus*).
 Bentgrass (*Agrostis*).
 Wild oat (*Avena*).
 Bermuda grass (*Cynodon*).
 Trichloris (*Trichloris*).
 Grama (*Bouteloua*).
 Buffalo grass (*Buchloe*).
 Lovegrass (*Eragrostis*).
 Junegrass (*Koeleria*).
 Orchard grass (*Dactylis*).
 Bluegrass (*Poa*).
 Fescue (*Festuca*).
 Bromegrass (*Bromus*).
 Wheatgrass (*Agropyron*).
 Sedge (*Carex*).
 Spanish-moss (*Tillandsia*).
 Rush (*Juncus*).
 Woodrush (*Juncoides*).
 Wild onion (*Allium*).
 Wood nettle (*Laportea*).
 Wild buckwheat (*Eriogonum*).

Dock (*Rumex*).
 Knotweed (*Polygonum*).
 Lambsquarters (*Chenopodium*).
 Pigweed (*Blitum*).
 Saltbush (*Atriplex*).
 Red sage (*Kochia*).
 Glasswort (*Salicornia*).
 Russian-thistle (*Salsola*).
 Redroot (*Amaranthus*).
 Sheeplick (*Guilleminea*).
 Umbrellawort (*Allionia*).
 Boerhaavia (*Boerhaavia*).
 Carpetweed (*Mollugo*).
 Purslane (*Portulaca*).
 Bitterroot (*Lewisia*).
 Chickweed (*Alsine*).
 Columbine (*Aquilegia*).
 Meadowvroe (*Thalictrum*).
 Corydalis (*Capnoides*).
 Wild cabbage (*Caulanthus*).
 Peppergrass (*Lepidium*).
 Mustard (*Brassica*).
 Lesquerella (*Lesquerella*).
 Sophia (*Sophia*).
 Saxifrage (*Saxifraga*).
 Alumroot (*Heuchera*).
 Riceroor (*Lithophragma*).
 Strawberry (*Fragaria*).
 Cinquefoil (*Potentilla*).

⁵ Crabs and wild seedlings of the cultivated apple.

Dryocallis (<i>Dryocallis</i>).	Phlox (<i>Phlox</i>).
Dwarf rose (<i>Chamaerhodos</i>).	Skunkweed (<i>Polemonium</i>).
Huajillo (<i>Pithecolobium</i>).	Waterleaf (<i>Hydrophyllum</i>).
Desmanthus (<i>Desmanthus</i>).	Stickseed (<i>Echinosperrum</i>).
Blueweed (<i>Hoffmanseggia</i>).	Bluebells (<i>Mertensia</i>).
Thermopsis (<i>Thermopsis</i>).	Puccoon (<i>Lithospermum</i>).
Bur-clover (<i>Medicago</i>).	Horsemint (<i>Agastache</i>).
Clover (<i>Trifolium</i>).	Catspaw (<i>Lamium</i>).
Birdsfoot trefoil (<i>Lotus</i>).	Pentstemon (<i>Pentstemon</i>).
Parosela (<i>Parosela</i>).	Speedwell (<i>Veronica</i>).
Prairieclover (<i>Kuhnistera</i>).	Indian paintbrush (<i>Castilleja</i>).
Sweetweed (<i>Hedysarum</i>).	Plantain (<i>Plantago</i>).
Beggarweed (<i>Meibomia</i>).	Partridgeberry (<i>Mitchella</i>).
Bushclover (<i>Lespedeza</i>).	Mexican-clover (<i>Richardia</i>).
Vetch (<i>Vicia</i>).	Cleavers (<i>Galium</i>).
Pea (<i>Lathyrus</i>).	Valerian (<i>Valeriana</i>).
Hogpeanut (<i>Amphicarpa</i>).	Xanthisma (<i>Xanthisma</i>).
Milk pea (<i>Galactia</i>).	Fleabane (<i>Erigeron</i>).
Wild bean (<i>Phaseolus</i>).	Niggerhead (<i>Rudbeckia</i>).
Wild bean (<i>Strophostyles</i>).	Balsamroot (<i>Balsamorhiza</i>).
Geranium (<i>Geranium</i>).	Wyethia (<i>Wyethia</i>).
Alfilaria (<i>Erodium</i>).	Viguiera (<i>Viguiera</i>).
Woodsorrel (<i>Oxalis</i>).	Mountain sunflower (<i>Helianthella</i>).
Jewelweed (<i>Impatiens</i>).	Tallowweed (<i>Actinella</i>).
False mallow (<i>Malvastrum</i>).	Fall tallowweed (<i>Amblyolepis</i>).
Willowweed (<i>Epilobium</i>).	Poreleaf (<i>Porophyllum</i>).
Fireweed (<i>Chamaenerion</i>).	Yarrow (<i>Achillea</i>).
Evening-primrose (<i>Oenothera</i>).	Sagewort (<i>Artemisia</i>).
Sweet cicely (<i>Osmorrhiza</i>).	Arnica (<i>Arnica</i>).
Lovage (<i>Ligusticum</i>).	Thistle (<i>Cirsium</i>).
Angelica (<i>Angelica</i>).	Star-thistle (<i>Centaurea</i>).
Leptotaenia (<i>Leptotaenia</i>).	Dandelion (<i>Taraxacum</i>).
Cogswellia (<i>Cogswellia</i>).	Wild lettuce (<i>Lactuca</i>).
Cow-parsnip (<i>Heracleum</i>).	False dandelion (<i>Agoseris</i>).
Pyrola (<i>Pyrola</i>).	Hawksbeard (<i>Crepis</i>).
Shepherds-purslane (<i>Androsace</i>).	Hawkweed (<i>Hieracium</i>).
Elkweed (<i>Fraseria</i>).	

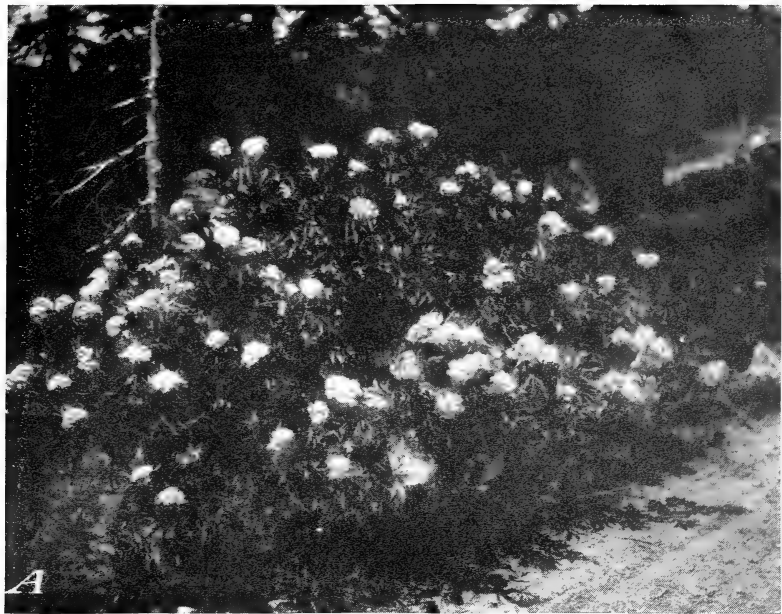
MAST PRODUCERS

Walnut (<i>Juglans</i>).	Chestnut, chinquapin (<i>Castanea</i>).
Hickory (<i>Hicoria</i>).	Giant chinquapin (<i>Castanopsis</i>).
Hazel (<i>Corylus</i>).	Oak (<i>Quercus</i>).
Beech (<i>Fagus</i>).	Tanoak (<i>Lithocarpus</i>).

FRUIT PRODUCERS

Inclusion of fruit producers here is mostly on the basis of preference by birds as revealed by stomach analyses; field observations on birds and information of both derivations on mammals may show the desirability of making additions.

Juniper, red cedar (<i>Juniperus</i>) (pl. 1, B).	Sassafras (<i>Sassafras</i>).
Palmetto (<i>Sabal</i>).	Spicebush (<i>Benzoin</i>).
Scrub palmetto (<i>Serenoa</i>).	Cotoneaster (<i>Cotoneaster</i>).
Greenbrier (<i>Smilax</i>).	Hawthorn (<i>Crataegus</i>).
Waxmyrtle (<i>Myrica</i>).	Apple (<i>Malus</i>).
Hackberry (<i>Celtis</i>).	Mountain-ash (<i>Sorbus</i>).
Mulberry (<i>Morus</i>).	Chokeberry (<i>Aronia</i>).
Osage-orange (<i>Toxylon</i>).	Toyon (<i>Heteromeles</i>).
Rouge-plant (<i>Rivina</i>).	Serviceberry (<i>Amelanchier</i>) (pl. 3).
Pokeberry (<i>Phytolacca</i>).	Squaw-apple (<i>Peraphyllum</i>).
Moonseed (<i>Menispermum</i>).	Blackberry, raspberry (<i>Rubus</i>).
Snailseed (<i>Cebatha</i>).	Strawberry (<i>Fragaria</i>).
Bay (<i>Persca</i>).	Rose (<i>Rosa</i>).
California-laurel (<i>Umbellularia</i>).	Plum (<i>Prunus</i>).
	Chinaberry (<i>Melia</i>).



B13632; B2906M

A, Scarlet elder (*Sambucus pubens*): Fair browse and widely relished fruit. B, A smartweed (*Polygonum*): One of the best seed producers.



Crowberry (*Empetrum*).
 Peppertree (*Schinus*).
 Sumac (*Rhus*).
 Holly (*Ilex*).
 Mountain-holly (*Nemopanthes*).
 Jujube (*Zizyphus*).
 Squawbush (*Condalia*).
 Supplejack (*Berchemia*).
 Grape (*Vitis*).
 Virginia creeper (*Parthenocissus*).
 Ampelopsis (*Ampelopsis*).
 Treebine (*Cissus*).
 Passionflower (*Passiflora*).
 Pricklypear, tuna, cholla (*Opuntia*).
 Daphne (*Daphne*).
 Leatherwood (*Dirca*).
 Sea-buckthorn (*Hippophaë*).
 Buffaloberry (*Lepargyrea*).
 Elaeagnus (*Elaeagnus*).
 Aralia (*Aralia*).
 Tupelo (*Nyssa*).
 Dogwood (*Cornus*) (pl. 4, A).

Wintergreen, salal (*Gaultheria*).
 Madrone (*Arbutus*).
 Manzanita, bearberry (*Arctostaphylos*) (pl. 1, A).
 Huckleberry (*Gaylussacia*).
 Blueberry (*Vaccinium* (pl. 4, B)).
 Bumelia (*Bumelia*).
 Persimmon (*Diospyros*).
 Osmanthus (*Osmanthus*).
 Adelia (*Forestiera*).
 Fringetree (*Chionanthus*).
 Privet (*Ligustrum*).
 Anagua (*Ehretia*).
 Beautyberry (*Callicarpa*).
 Matrimony-vine (*Lycium*).
 Groundcherry (*Physalis*).
 Partridgeberry (*Mitchella*).
 Elderberry (*Sambucus*) (pl. 5, A).
 Blackhaw, cranberrybush (*Viburnum*).
 Snowberry, coralberry (*Symphoricarpos*).
 Honeysuckle (*Lonicera*).

SEED PRODUCERS

Ordinarily weeds are thought of as the principal source of the seeds eaten by wildlife, but seeds of certain trees also are important. There is a popular tendency to group these, and in fact all seeds, nuts, and fruits that can be gleaned from the forest floor, under the term mast. The occasional abundant crops of pine seeds, especially, are referred to as pine mast. For the purpose of this circular, however, the term "mast" is restricted to nuts and acorns, and the word "seeds" is used to include dry (as contrasted with fleshy) fruits in addition to grains, akenes, and other plant fructifications popularly called seeds.

Pine (*Pinus*).
 Spruce (*Picea*).
 Hemlock (*Tsuga*).
 Fir, balsam (*Abies*).
 Beardgrass (*Andropogon*).
 Bull grass (*Paspalum*).
 Switchgrass (*Panicum*).
 Wild millet (*Echinochloa*).
 Crabgrass (*Digitaria*).
 Bristle grass (*Setaria*).
 Canary grass (*Phalaris*).
 Needlegrass (*Stipa*).
 Timothy (*Phleum*).
 Dropseed (*Sporobolus*).
 Bentgrass (*Agrostis*).
 Bermuda grass (*Cynodon*).
 Grama (*Bouteloua*).
 Goosegrass (*Eleusine*).
 Keygrass (*Mananthochloë*).
 Lovegrass (*Eragrostis*).
 Saltgrass (*Distichlis*).
 Bluegrass (*Poa*).
 Fescue (*Festuca*).
 Bromegrass (*Bromus*).
 Barley (*Hordeum*).
 Nutgrass (*Cyperus*).
 Sedge (*Carex*).
 Dayflower (*Commelina*).

Blue beech (*Carpinus*).
 Hophornbeam (*Ostrya*).
 Birch (*Betula*).
 Alder (*Alnus*).
 Elm (*Ulmus*).
 Hemp (*Cannabis*).
 Wild buckwheat (*Eriogonum*).
 Dock (*Rumex*).
 Smartweed (*Polygonum*) (pl. 5, B).
 Lambsquarters (*Chenopodium*).
 Tumbleweed (*Cycloloma*).
 Saltbush (*Atriplex*).
 Russian-thistle (*Salsola*).
 Redroot (*Amaranthus*).
 Carpetweed (*Mollugo*).
 Rockpurslane (*Calandrinia*).
 Indian lettuce (*Montia*).
 Purslane (*Portulaca*).
 Catchfly (*Silene*).
 Campion (*Lychnis*).
 Chickweed (*Alsine*).
 Chickweed (*Cerastium*).
 Sandwort (*Arenaria*).
 Spurry (*Spergula*).
 Magnolia (*Magnolia*).
 Tuliptree (*Liriodendron*).
 Buttercup (*Ranunculus*).
 California-poppy (*Eschscholtzia*).

Mustard (*Brassica*).
 Shepherds-purse (*Bursa*).
 Sweetgum (*Liquidambar*).
 Cinquefoil (*Potentilla*).
 Catclaw (*Acacia*).
 Senna (*Cassia*).
 Partridge-pea (*Chamaecrista*).
 Honeylocust (*Gleditsia*).
 Bur-clover (*Medicago*).
 Sweetclover (*Melilotus*).
 Clover (*Trifolium*).
 Locust (*Robinia*) (pl. 7, B).
 Sesbania (*Sesban*).
 Pencil flower (*Stylosanthes*).
 Beggarweed (*Meibomia*).
 Bushclover (*Lespedeza*).
 Vetch (*Vicia*).
 Wild pea (*Lathyrus*).
 Hogpeanut (*Amphicarpa*).
 Milk pea (*Galactia*).
 Wild bean (*Strophostyles*).
 Geranium (*Geranium*).
 Alfilaria (*Erodium*).
 Wood sorrel (*Oxalis*).
 Doveweed (*Croton*).
 Turkey mullein (*Eremocarpus*).
 Copperleaf (*Acalypha*).
 Cowitch (*Tragia*).
 Queen's delight (*Stillingia*).
 Bittersweet (*Celastrus*).
 Burningbush (*Euonymus*).
 Maple (*Acer*).
 Jewelweed (*Impatiens*).

Deer brush, Jersey-tea (*Ceanothus*).
 Mallow (*Malva*).
 Sida (*Sida*).
 Hibiscus (*Hibiscus*).
 Violet (*Viola*).
 Evening-primrose (*Oenothera*).
 Ash (*Fraxinus*).
 Morning-glory (*Ipomoea*).
 Bindweed (*Convolvulus*).
 Dodder (*Cuscuta*).
 Heliotrope (*Heliotropium*).
 Amsinckia (*Amsinckia*).
 Puccoon (*Lithospermum*).
 Verbena (*Verbena*).
 Lippia (*Lippia*).
 Bluecurls (*Trichostema*).
 Plantain (*Plantago*).
 Buttonbush (*Cephalanthus*).
 Buttonweed (*Diodia*).
 Cleavers (*Galium*).
 Marsh-elder (*Iva*).
 Ragweed (*Ambrosia*).
 Sunflower (*Helianthus*).
 Bur-marigold (*Bidens*).
 Tarweed (*Madia*).
 Tarweed (*Hemizonia*).
 Camomile (*Anthemis*).
 Thistle (*Cirsium*).
 Milkthistle (*Silybum*).
 Star-thistle (*Centaurea*).
 Dandelion (*Taraxacum*).
 Sowthistle (*Sonchus*).
 Wild lettuce (*Lactuca*).

PLANTS USEFUL TO WILDLIFE THAT HAVE BEEN RECOMMENDED FOR EROSION CONTROL

CROP AND PASTURE PLANTS

The province of this publication is to deal chiefly with wild or naturalized plants of recognized value to wildlife rather than with cultivated sorts, the utilization of which by wildlife is often the cause of economic loss. Some agricultural plants should be mentioned, however, as they are of pronounced value in erosion control. They have the very great merit, moreover, of promptly yielding products that may pay for their planting and care. Where lands still tillable are concerned, the first effort in erosion control usually is to establish some of the commonly planted grasses or legumes. Rye, or rye and sweetclover,⁶ for instance, are highly recommended for the Midwest; but from among the cereal grains, the pasture and hay grasses, and the legumes (clover, bushclover, sweetclover, cowpea, soybean), or combinations of these, vegetative covering can be quickly established while more time-consuming methods are under advisement or in early but ineffective stages of development. Lespedezas (pl. 6, A) are used in protecting the surface where cultivation is being abandoned, especially on account of their supplementary value to wildlife. They even have a place in gully planting (pl. 6, B).

⁶ The seeds of sweetclover are reported by Paul L. Errington (letter) to be somewhat poisonous to bobwhites and pheasants.



SCS-28-380; SCS-28-379

A, "Galled" ridge completely covered with grass and lespedeza. "Save the surface and save all." B. Gully bank with a good cover of Korean lespedeza and *Lespedeza sericea*. (Photographs from Soil Conservation Service.)



SCS2-323(20); SCS2-323(19)

A, Badly eroding gully. B, Gully shown in A stabilized by planting of black locust (*Robinia pseudoacacia*).
(Photographs from Soil Conservation Service.)

Sizable seeds of both grasses and legumes are consumed by various wild creatures, and some toll, usually not objectionable in extent, is taken of their foliage. Most of the forage and grain crops furnish summer cover, but as a rule they are not of value as winter shelter. Where wildlife feeding is an objective, patches of these crops are devoted to the purpose. They are of most value to wildlife if the sowings are near good refuge cover of low, dense, woody, and, preferably, evergreen plants.

VINES, SHRUBS, AND TREES

On untillable land and on land where erosion has removed practically all the topsoil, plantings of a more permanent nature than field crops or even pasture plants are likely to be required. It is in this respect, and especially for stabilizing gullies⁷ (pl. 7), that the vines, shrubs, and trees so useful in providing cover and food for wildlife have an important use. They will serve also for binding soil on steep slopes, on stream and ditch banks, and on terrace margins. For the sake of their value to wildlife, for improving the appearance of landscapes, and for yielding wood and other products of direct value to man, they may well be encouraged on any spots of rough or infertile land or on other uncultivated parts of the farm.

LIST OF PLANTS

The recommendations here compiled have been based in part on possession by the plants of far-reaching root systems or of the habit of making dense growth and in part on the capacity of the plants to grow on lands denuded of topsoil. This latter quality accounts for inclusion of the tap-rooted pines and some other relatively weak-rooted plants that have, however, marked ability to pioneer on barren ground. Arrangement is in systematic order. Letters indicate that the plant or group of plants is of value for cover (C), browse (B), herbage (H), mast (M), fruit (F), or seeds (S).

Pine.....	<i>Pinus</i> spp.....	C B S
Norway spruce.....	<i>Picea excelsa</i>	C B S
White spruce.....	<i>Picea glauca</i>	C B S
Black spruce.....	<i>Picea nigra</i>	C B S
Douglas fir.....	<i>Pseudotsuga taxifolia</i>	C B
White cedar.....	<i>Chamaecyparis thyoides</i>	C B
Common juniper.....	<i>Juniperus communis</i>	C B F
Irish juniper.....	<i>Juniperus communis hibernica</i>	C B F
Creeping juniper.....	<i>Juniperus horizontalis</i>	C B F
Rocky mountain juniper.....	<i>Juniperus scopulorum</i>	C B F
Red cedar.....	<i>Juniperus virginiana</i>	C B F
Beardgrass, bluestem.....	<i>Andropogon</i> spp.....	H S
Galleta, tobosa, curly mesquite.....	<i>Hilaria</i> spp.....	H
Knotgrass.....	<i>Paspalum distichum</i>	S
Creeping bent.....	<i>Agrostis palustris</i>	H S
Colonial bent.....	<i>Agrostis tenuis</i>	H S
Needlegrass.....	<i>Stipa</i> spp.....	H S
Dropseed, sacaton.....	<i>Sporobolus</i> spp.....	H S
Grama.....	<i>Bouteloua</i> spp.....	H S
Buffalo grass.....	<i>Buchloë dactyloides</i>	H
Junegrass.....	<i>Koeleria cristata</i>	H

⁷ MEGINNIS, H. G. USING SOIL-BINDING PLANTS TO RECLAIM GULLIES IN THE SOUTH. U. S. Dept. Agr., Farmers' Bull. 1697, 17 pp., illus. 1933. Obtainable from Superintendent of Documents, Washington, D. C., for 5 cents a copy.

Bluegrass	<i>Poa</i> spp.	HS
Fescues	<i>Festuca</i> spp.	HS
Wheatgrasses	<i>Agropyron</i> spp.	H
Greenbrier	<i>Smilax</i> spp.	C B F
Butternut	<i>Juglans cinerea</i>	M
Black walnut	<i>Juglans nigra</i>	M
Texas walnut	<i>Juglans rupestris major</i>	M
Mockernut	<i>Hicoria alba</i>	B M
Pignut	<i>Hicoria glabra</i>	B M
Shagbark	<i>Hicoria ovata</i>	B M
Sweetfern	<i>Comptonia asplenifolia</i>	CB
California waxmyrtle	<i>Myrica californica</i>	CF
Northern bayberry	<i>Myrica carolinensis</i>	CF
Carolina poplar	<i>Populus eugenei</i>	B
Western cottonwood	<i>Populus deltoides</i>	B
Cottonwood	<i>Populus sargentii</i>	B
Aspen	<i>Populus tremuloides</i>	B
Willow	<i>Salix</i> spp.	CB
Hazelnut	<i>Corylus americana</i>	CB M
Birch	<i>Betula</i> sp.	CB S
Alder	<i>Alnus</i> spp.	CB S
Beech	<i>Fagus grandifolia</i>	B M
Hairy chestnut	<i>Castanea mollissima</i>	B M
Chinquapin	<i>Castanea pumila</i>	B M
Oak	<i>Quercus</i> spp. ^s	CB M
American elm	<i>Ulmus americana</i>	BS
Chinese elm	<i>Ulmus parvifolia</i>	BS
Siberian elm	<i>Ulmus pumila</i>	BS
Hackberry	<i>Celtis</i> spp.	BF
Russian mulberry	<i>Morus alba tatarica</i>	F
Red mulberry	<i>Morus rubra</i>	F
Black mulberry	<i>Morus nigra</i>	F
Osage-orange	<i>Toxylon pomiferum</i>	CF
Saltbushes	<i>Atriplex</i> spp.	CB S
Greasewood	<i>Sarcobatus vermiculatus</i>	B
Cucumbertree	<i>Magnolia acuminata</i>	S
Tuliptree	<i>Liriodendron tulipifera</i>	S
Silkvine	<i>Clematis drummondii</i>	C
Moonseed	<i>Menispermum canadense</i>	F
Asiatic moonseed	<i>Menispermum dauricum</i>	F
Sassafras	<i>Sassafras variifolium</i>	BF
Sweetgum	<i>Liquidambar styraciflua</i>	S
Rock cotoneaster	<i>Cotoneaster horizontalis</i>	CF
Hawthorn	<i>Crataegus</i> spp.	CB F
Narrowleaf firethorn	<i>Pyracantha angustifolia</i>	CB F
Scarlet firethorn	<i>Pyracantha coccinea</i>	CB F
Chokeberry	<i>Aronia</i> spp.	BF
American mountain-ash	<i>Sorbus americana</i>	BF
European mountain-ash	<i>Sorbus aucuparia</i>	BF
Apple	<i>Malus</i> spp.	CB F
Serviceberry	<i>Amelanchier canadensis</i>	BF
Blackberry, raspberry	<i>Rubus</i> spp.	CB F
Apache-plume	<i>Fallugia paradoxa</i>	B
Rose	<i>Rosa</i> spp.	CB F
Wild plum	<i>Prunus americana</i>	CF
Mesquite	<i>Prosopis glandulosa</i>	CB
Honeylocust	<i>Gleditsia triacanthos</i>	B
Paloverde	<i>Cercidium</i> spp.	CB
Siberian pea-tree	<i>Caragana arborescens</i>	C
Wisteria	<i>Kraunkia frutescens</i>	C
Black locust	<i>Robinia pseudoacacia</i>	CS
Shrub bushclover	<i>Lespedeza bicolor</i>	HS
Shrub bushclover	<i>Lespedeza cyrtobotrya</i>	HS
Wild bean	<i>Strophostyles helvola</i>	HS

^s The scrub oaks are best.

Sumac	<i>Rhus</i> spp.	C B F
Possumhaw	<i>Ilex decidua</i>	C F
Inkberry	<i>Ilex glabra</i>	C F
Holly	<i>Ilex opaca</i>	C F
Black alder	<i>Ilex verticillata</i>	C F
Wahoo	<i>Euonymus atropurpureus</i>	S
Wintercreeper	<i>Euonymus radicans</i>	C S
Burningbush	<i>Euonymus europaeus</i>	S
Oriental bittersweet	<i>Celastrus orbiculatus</i>	C S
American bittersweet	<i>Celastrus scandens</i>	C S
Canotia	<i>Canotia holacantha</i>	C
Boxelder	<i>Acer negundo</i>	B S
Red maple	<i>Acer rubrum</i>	B S
Sugar maple	<i>Acer saccharum</i>	B S
Silver maple	<i>Acer saccharinum</i>	B S
Texas jujube	<i>Zizyphus obtusifolia</i>	C F
Squawbush	<i>Condalia</i> spp.	F
Jersey-tea	<i>Ceanothus americanus</i>	C B S
Grape	<i>Vitis</i> spp.	C B F
Virginia creeper	<i>Parthenocissus quinquefolia</i>	C F
Linden	<i>Tilia heterophylla</i>	B
Basswood	<i>Tilia glabra</i>	B
Hibiscus	<i>Hibiscus</i> spp.	S
Flannelbush	<i>Fremontodendron californicum</i>	C
Saltcedar	<i>Tamarix gallica</i>	C
Athel tree	<i>Tamarix aphylla</i>	C
Allthorn	<i>Koeberlinia spinosa</i>	C
Pricklypear, tuna, cholla	<i>Opuntia</i> spp.	C B F
Silver buffaloberry	<i>Lepargyrea argentea</i>	C B F
Russian-olive	<i>Elaeagnus angustifolia</i>	C F
Silky dogwood	<i>Cornus amomum</i>	C B F
Gray dogwood	<i>Cornus paniculata</i>	C B F
Flowering dogwood	<i>Cornus florida</i>	C B F
Red-osier	<i>Cornus stolonifera</i>	C B F
Mossheath	<i>Cassiope</i> spp.	B
Wintergreen	<i>Gaultheria procumbens</i>	C B F
Pinemat	<i>Arctostaphylos nevadensis</i>	C B F
Bearberry	<i>Arctostaphylos uva-ursi</i>	C B F
Huckleberry, dangleberry	<i>Gaylussacia</i> spp.	C B F
Blueberry	<i>Vaccinium</i> spp.	C B F
Persimmon	<i>Diospyros virginiana</i>	F
Buckthorn bumelia	<i>Bumelia lycioides</i>	F
White ash	<i>Fraxinus americana</i>	B S
Green ash	<i>Fraxinus lanceolata</i>	B S
Fringetree	<i>Chionanthus virginica</i>	F
Amur privet	<i>Ligustrum amurense</i>	F
Regel privet	<i>Ligustrum ibota regelianum</i>	F
European privet	<i>Ligustrum vulgare</i>	F
Beautyberry	<i>Callicarpa americana</i>	F
Desertwillow	<i>Chilopsis linearis</i>	C
Trumpetreeper	<i>Tecoma radicans</i>	C
Elderberry	<i>Sambucus</i> spp.	B F
Cranberrybush, arrowwood, black-haw	<i>Viburnum</i> spp.	B F
Coralberry, snowberry	<i>Symphoricarpos</i> spp.	C B F
Sweet honeysuckle	<i>Lonicera caprifolium</i>	C B F
Tatarian honeysuckle	<i>Lonicera tatarica</i>	C B F
Fly honeysuckle	<i>Lonicera xylosteum</i>	C B F
Rabbitbrush	<i>Chrysothamnus</i> spp.	C B
Seepwillow	<i>Baccharis glutinosa</i>	C
Burrobrush	<i>Hymenoclea monogyra</i>	C B
Brittlebush	<i>Encelia farinosa</i>	C
Estafiata	<i>Artemisia frigida</i>	C B
Bud sagebrush	<i>Artemisia spinescens</i>	C B
Big sagebrush	<i>Artemisia tridentata</i>	C B

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